SSIPMT RAIPUR

Shri Shankaracharya Institute of Professional Management & Technology

Department of Civil Engineering

Class Test – II Session: July – Dec, 2022 Month – January

Semester – 5th Subject – SED - I, Code – CO20511 (020)

Time Allowed: 2 hrs Max Marks: 40

Note: - Attempt all questions. Question a and b is compulsory. Carrying 4 marks. Attempt any 4 from b,c,d,e and f IS 456: 2000 is Permitted.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	COs
	Part- I			
(a)	Explain design consideration of Slab as per IS CODE 456:2000.	[4]	Apply	CO1
(b)	Draw the block stress parameter diagram for doubly reinforced beam.	[4]	Apply	CO1
(a)	A rectangular beam size 230 mm wide and 500 mm effective depth is subjected to a factored moment of 200 kNm. Find the reinforcement for flexure. The material is M20 grade and HYSD reinforcement of grade Fe 415.	[8]	Evaluate	CO1
(b)	Design a one way slab with a clear span of 5m, simply supported on 230mm thick masonry walls and subjected to a live load of 4kN/m² and a surface finish of 1kN/mm².Assume Fe 415 steel.	[8]	Evaluate	CO1
(c)	Design a R.C. slab for a room measuring 5mx6m size. The slab is simply supported on all the four edges, with corners held down and carries a super-imposed load of 3 KN/m2 inclusive of floor finish etc. Use M20 grade of concrete and Fe 415 grade of steel.	[8]	Evaluate	CO2
(d)	A t-beam of effective width 1200, thickness of slab 100 mm, width of rib 300 mm and effective depth of 560 mm is reinforced with 4 no. 25 mm diameter bars. Calculate the factored moment of resistance. The materials are M20 grade concrete and HYSD bars.	[8]	Evaluate	CO2
(e)	Calculate the factored moment of resistance for a T-Beam with following Data Effective width – 1200 mm D_f – 100 mm b_w – 300 mm d – 560 mm 5 nos 25 mm Dia M20 and HYSD Bar	[8]	Evaluate	CO2

Shri Shankaracharya Institute of Professional Management & Technology, Raipur
Department of Civil Engineering
Class Test – II **Session: July-December, 2022** **Month – January 2023**
Semester – 5th **Subject –HYDROLOGY &WATER RESOURCES ENGINEERING**
Code – C020512 (020) Time Allowed: 2 hrs. Max Marks: 40

Note: -Part A is compulsory in each section. Attempt any two from part B, C and D. Assume suitable data, if required, and mention it clearly.

<table>
<tr><th>Q. No.</th><th>Questions</th><th>Marks</th><th>Levels of Bloom`s taxonomy</th><th>CO's</th></tr>
<tr><td colspan="5">Section I</td></tr>
<tr><td>A</td><td>Define Hydrograph. What are the components of Hydrograph?</td><td>4</td><td>Understand</td><td>CO2</td></tr>
<tr><td>B</td><td>The ordinates of a unit hydrograph of 6 hr unit duration for a catchment of 311 sq.km are given below. Compute the ordinates of 9 hr. unit hydrograph for the same catchment.
<table>
<tr><td>Time, hr</td><td>0</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td><td>33</td><td>36</td><td>39</td><td>42</td></tr>
<tr><td>UH Ordinate m^3/s</td><td>0</td><td>9</td><td>20</td><td>35</td><td>49</td><td>43</td><td>35</td><td>28</td><td>22</td><td>17</td><td>12</td><td>9</td><td>6</td><td>3</td><td>0</td></tr>
</table></td><td>8</td><td>Understand</td><td>CO2</td></tr>
<tr><td>C</td><td>Explain briefly the types of runoff</td><td>8</td><td>Analyze</td><td>CO2</td></tr>
<tr><td>D</td><td>What do you understand by unit hydrograph? How is it derived? Explain its uses</td><td>8</td><td>Analyze</td><td>CO2</td></tr>
<tr><td colspan="5">Section II</td></tr>
<tr><td>A</td><td>Write short notes on:
1. Crop period and base period
2. Intensity of irrigation and G.C.A</td><td>4</td><td>Understand</td><td>CO3</td></tr>
<tr><td>B</td><td>Table given below gives the necessary data about the crop their duty and the area under each crop, commanded by a canal taking off from a storage tank. Taking a time factor for the canal to be 13/20. Calculate the discharge required at the head of the canal. If the capacity factor is 0.8, determine the design discharge.
<table>
<tr><th>Crop</th><th>Base period (days)</th><th>Area (hectares)</th><th>Duty at the head of the canal (hectare/cumecs)</th></tr>
<tr><td>Sugar-cane</td><td>320</td><td>850</td><td>580</td></tr>
<tr><td>Overlap for sugar cane for hot weather</td><td>90</td><td>120</td><td>580</td></tr>
<tr><td>Wheat (rabi)</td><td>120</td><td>600</td><td>1600</td></tr>
<tr><td>Bajra (Monsoon)</td><td>120</td><td>500</td><td>2000</td></tr>
<tr><td>Vegetables (hot weather)</td><td>120</td><td>360</td><td>600</td></tr>
</table></td><td>8</td><td>Analyze</td><td>CO3</td></tr>
<tr><td>C</td><td>A water course has a culturable commanded area of 1200 hectares. The intensity of irrigation for the crop A is 40% and for crop B is 35%, both the crops being rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of water course if the kor depth for crop A is 10 cm and for B it is 16cm.</td><td>8</td><td>Analyze</td><td>CO3</td></tr>
<tr><td>D</td><td>After how many days will you supply water to the soil in order to ensure sufficient irrigation of the given crop, if-
(i) Field capacity of the soil = 28%
(ii) Permanent wilting point = 13%
(iii) Dry density of soil = 1.3 gm./cc
(iv) Daily Consumptive use = 13 mm
Effective depth of root zone = 70cm</td><td>8</td><td>Analyze</td><td>CO3</td></tr>
</table>

Shri Shankaracharya Institute of Professional Management & Technology, Raipur

Department of Civil Engineering

SSIPMT

Class Test – II Session: July-Dec, 2022 Month – January

Semester – 5th Subject – Geotech Engineering Sub. Code – C020513(020)

Time Allowed: **2 hrs.** **Max Marks: 40**

Note: - In Part I & II, Question A is compulsory and attempt any two from B, C & D. Attempt all questions of part III.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
	Part I			
A.	Explain the followings: (i) Quick Sand Condition	[4]	Understand	CO2
B.	The water table in certain area is at a depth of 4m below the ground surface. To a depth of 12m, the soil consists of very fine sand having an average void ratio of 0.7. Above the water table, the sand has an average degree of saturation of 50%. Calculate the effective pressure on a horizontal plane at a depth 10 m below the ground surface. What will be the increase in the effective pressure if the soil gets saturated by capillarity upto a height of 1m above the water table ? Assume G = 2.65. Also draw the stress diagram.	[8]	Understand	CO2
C.	Describe soil samples and types of samplers.	[5]	Understand	CO5
D.	In a site reclamation project, 2.5 m of graded fill (γ =22 kN/m³) were laid in compacted layers over an existing layer of silty clay (γ_{sat} = 18 kN/m³) which was 3 m thick. This was underlain by a 2 m thick layer of gravel (γ_{sat} = 20 kN/m³). Assuming that the water table remains at the surface of the silty clay draw the effective stress profiles for case (i) before the fill is placed and case (ii) after the fill has been placed.	[8]	Evaluate	CO2
	Part II			
A.	Explain the followings: (i) Comparison between compaction and consolidation (ii) Mohr-Coulomb Theory	[4]	Understand	CO3
B.	Briefly discuss about the soil exploration methods.	[8]	Understand	CO5
C.	Derive the relationship between shear strength parameters and principal stresses.	[8]	Apply	CO3
D.	Consolidated undrained test was performed on two identical samples. The observation at failure are as follows. Stresses | Specimen 1 | Specimen 2 Cell pressure (kN/m²) | 250 | 350 Deviator stress (kN/m²) | 180 | 240 Pore pressure (kN/m²) | 100 | 150 Determine the effective angle of shearing resistance and cohesion value.	[8]	Evaluate	CO3

Shri Shankaracharya Institute of Professional Management & Technology
Department of Civil Engineering
Class Test – II **Session: July-Dec, 2022** **Month – January**
Semester – 5th **Subject – Transportation Engineering**
Code – C020514(020)
Time Allowed: 2 hrs. **Max Marks: 40**
Note: - In Part I & II, Question A is compulsory and attempt any two from B,C & D.

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	CO's
	Part I			
A.	Explain the desirable properties of road aggregate.	[4]	Understand	CO3
B.	Enumerate the CBR test to evaluate the stability of soil subgrade and other flexible pavement.	[8]	Understand	CO3
C.	Explain wear on rails with its classification and also make a neat sketch on different types of wear on rail.	[8]	Understand	CO4
D.	Define ballast cushion. What would be the expression for sleeper density if the rail length used in a track is 19 m and there are 22 sleepers under one rail length?	[8]	Understand , Analyze	CO4
	Part II			
A.	Define sleepers and write its functions	[4]	Understand	CO4
B.	Write short note on : Fish Plate, Coning of wheel, Types of rail	[8]	Understand	CO4
C.	Explain the terms: i) Super elevation ii) & Length of transition curve iii) Crossings	[8]	Understand	CO5
D.	A 5° curve diverges from 3° main curve in reverse direction in the layout of BG yard. If the speed on the branch line is restricted to 35 kmph. Determine the restricted speed on the main line.	[8]	Analyze	CO5

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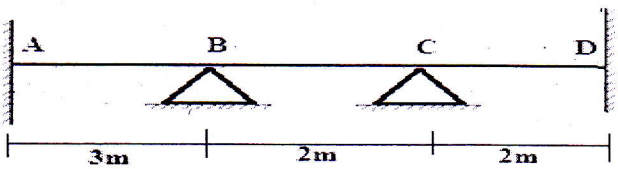
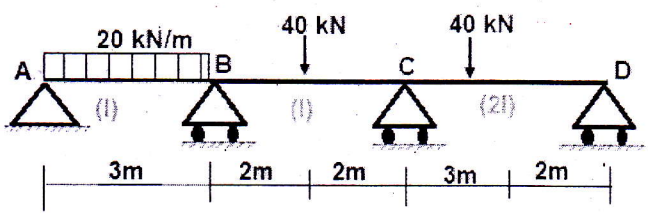
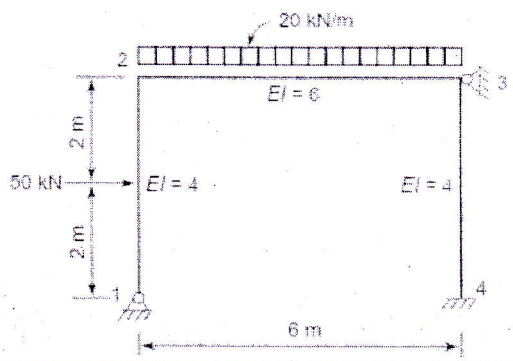
Class Test – II Session: Jul – Dec, 2022 Month – January

IPMT **Semester – 5th** **Subject – Structural Analysis-II** **Code – C020531(020)**

Time Allowed: 2 hrs Max Marks: 40

Note: - In every part Question A is compulsory, Attempt any two Questions from B,C and D .

Q. No.	Questions	Marks	Levels of Bloom's taxonomy	COs
	Part-I			
A.	I. Discuss the following: a) Absolute Stiffness b) Carry Over Moment c) Distribution Factor	[4]	Understand	CO3
B	Analyze the continuous beam as shown in figure, using moment distribution method and find support moments if support B sinks by 30 mm. Draw the bending moment diagram and the deflected shape of the beam. Take $E=2x10^5$ N/mm^2 and $I=3x10^6$ mm^4 constant for the whole beam. 	[08]	Analyse	CO3
C	Analyse the continuous beam ABCD as shown in figure by moment distribution method. Draw the bending moment diagram. 	[08]	Analyse	CO3
D	Using the moment distribution method, determine the end moments of the members of the frame shown in fig. and draw the bending moment diagram. *EI is the same throughout.* 	[08]	Analyse	CO3
	Part-II			
A	i. Enumerate the assumptions used in slope deflection method. ii. Discuss the procedure followed in slope deflection method.	[04]	Understand	CO4